



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant: Filipiak
Serial No.: 10/037,852
Filed: 01/04/2002
Group Art Unit: 3682
Examiner: Van Pelt, Bradley J.
Title: Dual Spherical Ball Clamp

MAILSTOP APPEAL BRIEF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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APPEAL BRIEF

Dear Sir:

In response to the Notification of Non-Compliance mailed May 13, 2004, Appellant is hereby resubmitting its Appeal Brief. Appellant filed a Notice of Appeal on December 1, 2003 and filed an Appeal Brief on March 1, 2004. Appellant has already paid the \$165.00 Appeal Brief fee with the Appeal Brief filed on March 1, 2004. However, the Commissioner is authorized to charge or credit deposit account no. 50-1482 in the name of Carlson, Gaskey & Olds, P.C. for any additional fees or credits.

REAL PARTY IN INTEREST

The real party in interest is Syron Engineering & Manufacturing, LLC, the assignee of the entire right and interest in this Application.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1, 2 and 22-25 stand finally rejected under 102(b). Claims 3-21 and 26-30 stand finally rejected under 103(a).

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF THE INVENTION

As shown in Figure 1, this invention relates to a ball and socket assembly. The ball and socket assembly includes a socket component 22 including a pair of sockets 28 and a pair of inclined edges 34 that define an opening for each of the sockets 28. A ball component is received in each of the sockets 28 (paragraph 15 of the specification). This basic structure is set forth in claims 1 and 22.

Claim 13 further adds that the socket component 22 includes a first clamp half 22 and a second clamp half 24 secured together to form the pair of sockets 28. The ball component includes a ball 30 and an arm 32, and the ball 30 is received in the socket 28 to allow for pivotal adjustment of the arm 32 (paragraph 15 of the specification).

Claims 3 and 14 depend on claims 2 and 13, respectively, and add that the balls 30 have a diameter of approximately 1.75 of an inch, and the arms 32 have a diameter of approximately 1.25 of an inch (paragraph 15 of the specification). Claims 25 and 29 depend on claims 2 and 13, respectively, and add that each arm 32 has a range of motion of 90° (paragraph 16 of the specification). Claims 26 and 30 depend on claims 10 and 13, respectively, and add that the gap between the clamps halves 22, 24 is adjustable (paragraph 21 of the specification). Claims 11 and 20 depend on claims 1 and 13, respectively, and add that the inclined edges 34 are inclined approximately 75° from a lower edge 36 of the assembly (paragraph 16 of the specification). Finally, Claims 24 and 28 depends on claims 1 and 13, respectively, and add that the inclined edges 34 are inclined relative to a lower edge 36 and an upper edge of the socket components (paragraph 16 of the specification).

ISSUES

1. Are Claims 1, 2 and 23-25 properly rejected under 35 U.S.C. 102(b) based on Chen?
2. Is Claim 22 properly rejected under 35 U.S.C. 102(b) based on Herbermann?
3. Is Claim 3 properly rejected under 35 U.S.C. 103(a) based on Chen?
4. Are Claims 4-12 and 26 properly rejected under 35 U.S.C. 103(a) based on Chen in view of Herbermann?
5. Are Claims 13-21 and 27-30 properly rejected under 35 U.S.C. 103(a) based on Herbermann in view of Chen?

GROUPINGS OF CLAIMS

- A. Claims 1, 2 and 23 stand or fall together.
- B. Claim 24 stands alone.
- C. Claim 25 stands alone.
- D. Claim 22 stands or falls alone.
- E. Claim 3 stands or falls alone.
- F. Claims 4-10 and 12 stand or fall together.
- G. Claim 11 stands alone.
- H. Claim 26 stands alone.
- I. Claims 13, 15-19, 24, 27 and 28 stand or fall together.
- J. Claim 14 stands alone.
- K. Claim 20 stands alone.
- L. Claim 29 stands alone.
- M. Claim 30 stands alone.

PATENTABILITY ARGUMENTS

A. The rejection of Claims 1, 2 and 23 under 35 U.S.C. 102(b) is improper.

The Examiner finally rejected Claims 1, 2 and 23 as being anticipated by Chen (U.S. Patent No. 5,973,248). Chen discloses a combination side-drum holder unit 30 including two ball socket halves 31, 31' and two balls 41 and 41' received between the halves 31 and 31' (column 2, lines 38

to 47). Each half 31, 31' includes a mounting shell 32 or 32' and a holder shells 33 or 33'. The Examiner states on page 2 of the Final Office Action that the inside of the sockets 331 and 341 of Chen are opposed inclined edges that define the socket openings, and the claims are anticipated. Appellant respectfully disagrees.

The present invention is patentable and strikingly different from Chen. The claimed invention is directed to a ball and socket assembly including:

...a socket component including a pair of sockets and a pair of opposed inclined edges, and each of said pair of opposed inclined edges defines an opening for each of said pair of sockets; and a ball component received in each of said pair of opposing sockets.

[See Claim 1]. Claims 1-30 of the present invention all share this same or similar feature. [See Claims 1-30].

The claimed invention is not anticipated by Chen. The socket component of the claimed invention includes a pair of inclined edges that define an opening for each of the sockets. Inclined is defined as deviating from the vertical or the horizontal. In Chen, the edges that define the opening for the sockets are not inclined. Rather, as shown in Figure 4, the opposed edges that define the openings for the sockets are vertical. The edges are vertical, and therefore do not deviate from the vertical or horizontal. Therefore, the edges of the socket component are not inclined as claimed by Appellant.

Additionally, the inside surface of the sockets 331 and 341 are not inclined. As shown in Figure 4, the inside surface of the sockets 331 and 341 is curved to form the rounded, spherical surface of the sockets 331 and 341. A curved inner surface is not the same as an inclined edge. Claims 1, 2 and 23 are not anticipated by Chen, and Appellant requests that the rejection be withdrawn.

B. The rejection of Claim 24 under 35 U.S.C. 102(b) is improper.

The rejection of Claim 24 is separately contested from the rejection of Claim 1 et al. Claim 24 recites that the inclined edges are inclined relative to a lower and an upper edge of the socket component. As shown in Figures 3 and 4 of Chen, the edges of the ball socket halves 31 and 31' are not inclined relative to the lower and upper edges of the ball socket halves 31 and 31' of the unit 30. As shown in the Figures, the edges of the ball socket halves 31 and 31' are vertical and perpendicular relative to both the upper and lower edges of the unit 30. Inclined is defined as deviating from the vertical or horizontal. Therefore, a vertical edge is not an inclined edge. Claim 24 is not anticipated by Chen, and a rejection based on anticipation is improper for Claim 24.

C. The rejection of Claim 25 under 35 U.S.C. 102(b) is improper.

The rejection of Claim 25 is separately contested from the rejection of Claim 1 et al. Claim 25 recites that the arm has a range of motion of 90°. Chen does not disclose that the rods 40 and 40' have a range of motion of 90°. Chen is silent as to the range of motion of the rods 40 and 40'. From Figure 3, it appears that the rods 40 and 40' have a range of motion less than 90°. Chen does not disclose that the rods 40 and 40' have a 90° range of motion. Claim 25 is not anticipated by Chen, and a rejection based on anticipation is improper for Claim 25.

x plane
can
move
360°

D. The rejection of Claim 22 under 35 U.S.C. 102(b) is improper.

Claim 22 stands rejected as being anticipated by Herbermann. Herbermann discloses a support system 20 includes a plurality of ball jointed links 26. Each link 32 includes a female socket 30 at one end and a male ball 32 at an opposing end (column 2, lines 25 to 32). Each link 26 includes only one socket 30.

Herbermann does not disclose a method for supporting an object including the step of providing a component having a pair of sockets. Herbermann only discloses that the link 26 includes *one* socket 30; the method of the claimed invention includes the step of providing a socket component including a pair of sockets. The Examiner states that because Herbermann discloses a plurality of ball jointed links 26, Herbermann must therefore include a pair of sockets. However, Appellant is not claiming the step of providing a structure having a plurality of sockets, but is rather

claiming the step of providing a socket component including a pair of sockets. The link 32 of Herbermann includes only one socket and not a pair of sockets as claimed. Claim 22 is not anticipated by Herbermann, and Appellant requests that the rejection be withdrawn.

E. The rejection of Claim 3 under 35 U.S.C. 103(a) is improper.

Claim 3 stands rejected as being obvious in view of Chen. Claim 3 recites that the balls have a diameter of 1.75 of an inch and the arms have a diameter of approximately 1.25 of an inch. The Examiner contends that it is an obvious matter to change the size and the diameter of the balls and arms. There is no suggestion in Chen to include balls and arms having the diameter as claimed, and certainly not the relative sizes. The Examiner contended that it is an obvious matter to change the size and the diameter of the balls and arms, but supplied no evidence. Appellant cannot respond without the evidence and asks that the hold be dropped or evidence supplied. There is no suggestion in Chen to include balls and arms having the claimed diameters, and certainly not the relative sizes. Claim 3 is not obvious in view of Chen.

F. The rejection of Claims 4-10 and 12 under 35 U.S.C. 103(a) is improper.

The rejection of Claims 4-10 and 12 is contested. Claims 4-10 and 12 stand rejected as being obvious in view of Chen and Herbermann. Claim 4 recites that the balls are made of a material harder than the material of the sockets. Claim 5 recites that the sockets are made of aluminum. Claim 6 recites that the sockets cover more than one half of the surface of the balls. Claims 7-10 claim that the socket component includes a first and a second clamp half. The Examiner admits that Chen does not disclose these features, but Claims 4-10 and 12 are obvious in view of the combination of Chen and Herbermann. Claims 4-10 and 12 are not obvious in view of Chen and Herbermann. Claims 4-10 and 12 depend on patentable independent claim 1 and are allowable for the reasons set forth above. Adding Herbermann to the combination does not render the claims obvious. Claims 4-10 and 12 are not obvious, and Appellant requests that the rejection be withdrawn.

G. The rejection of Claims 11 under 35 U.S.C. 102(b) is improper.

The rejection of Claim 11 is separately contested from the rejection of Claims 1 et al. Claim 11 recites that the inclined edges are inclined 75° from a lower edge of the assembly. As shown in Figures 3 and 4 of Chen, the edges of the ball socket halves 31 and 31' are not inclined relative with the lower and upper edges of the ball socket halves 31 and 31'. As shown in the Figures, the edges of the ball socket halves 31 and 31' are vertical. Inclined is defined as deviating from the vertical or horizontal. Therefore, an inclined edge is not a vertical edge. Chen does not disclose a socket component having an inclined edge, and therefore does not disclose a socket component having an inclined edge inclined 75° from a lower edge of the socket assembly. Herbermann also does not disclose any edges inclined 75° from a lower edge. Therefore, the combination of these references does not disclose, suggest or teach the claimed invention. Claim 24 is not obvious in view of Chen and Herbermann, and a rejection based on obviousness is improper for Claim 11.

H. The rejection of Claim 26 under 35 U.S.C. 102(b) is improper.

The rejection of Claim 26 is separately contested from the rejection of Claims 1 et al. Claim 26 recites that the gap between the clamp halves is adjustable. Chen does not disclose that the gap between the socket halves 31 and 31' is adjustable. Chen only discloses that the socket halves 31 and 31' are secured together by bolts screw bolts 333 and does not disclose that the gap between the halves 31 and 31' is adjustable. Herbermann discloses a socket 30 that retains a ball 32. The ball 32 is retained in the socket 30 by a worm clamp 28. Therefore, the socket 30 does not include a gap that separates socket halves. Neither reference discloses, suggests or teaches an adjustable gap, and therefore the combination of these references does not suggest the claimed invention. Claim 26 is not obvious, and Appellant requests that the rejection be withdrawn. Fig 5.

I. The rejection of Claims 13, 15-19, 21, 27 and 28 under 35 U.S.C. 102(b) is improper.

The rejection of 13, 15-19, 21, 27 and 28 is contested. Claims 13, 15-19, 21, 27 and 28 stand rejected as being obvious under Herbermann in view of Chen. Claims 13, 15-19, 21, 27 and 28 recite a robotic arm including a ball and socket assembly including a socket component having a first

clamp half and a second clamp half secured together to form a pair of sockets and a pair of opposed inclined edges. A ball component is received in each socket. The Examiner admits that Herbermann does not disclose that the ball jointed links 26 include a first half and a second half secured together. The Examiner contends that it would be obvious to modify Herbermann to include two socket halves as suggested by Chen, and Claims 13, 15-19, 21, 27 and 28 are obvious.

It is not obvious to form the links 26 of Herbermann of two halves because of Chen. In Herbermann, each link 32 includes a female socket 30 at one end and a male ball 32 at the opposing end. A ball 32 of another link 26 is secured to the socket 30 by a clamp 28. The clamp 28 is employed to secure adjoining links 26. Therefore, there is no reason or benefit to forming the links 26 of two halves to encase the ball 32 because the clamp 28 provides this function.

Additionally, there is no reason or motivation to form the links 26 of Herbermann of a first and a second socket half. In Chen, the sockets 331 cover more than half of the surface area of each ball 41. When the socket halves are secured together by the bolts 333, the ball 41 is secured in the socket 331. Even if the socket 30 of Herbermann was formed of two halves, the socket 30 would not be large enough to retain the ball 32. Therefore, a clamp 28 must be employed to secure ball 32 in the socket 30. It would not be possible to employ the two clamp half arrangement in Herbermann because the sockets 30 are not large enough to retain the ball 41. The claims are not obvious.

J. The rejection of Claim 14 under 35 U.S.C. 103(a) is improper.

The rejection of Claim 14 is separately contested. Claim 14 stand rejected as being obvious over Herbermann in view of Chan. Claim 14 recites that the balls have a diameter of 1.75 of an inch and the arms have a diameter of approximately 1.25 of an inch. The Examiner contends that it is an obvious matter to change the size and the diameter of the balls and arms. There is no suggestion in Chen or Herbermann to include balls and arms having the diameter as claimed, and certainly not the relative sizes. The Examiner contended that it is an obvious matter to change the size and the diameter of the balls and arms, but supplied no evidence. Appellant cannot respond without the evidence and asks that the hold be dropped or evidence supplied. There is no suggestion in Chen or Herbermann to include balls and arms having the claimed diameters, and certainly not the relative sizes. Claim 14 is not obvious in view of Chen.

K. The rejection of Claims 20 under 145 U.S.C. 102(b) is improper.

The rejection of Claim 20 is separately contested from the rejection of Claim 13 et al. Claim 20 recites that the inclined edges are inclined 75° from a lower edge of the assembly. As shown in Figures 3 and 4 of Chen, the edges of the ball socket halves 31 and 31' are not inclined relative with the lower and upper edges of the ball socket halves 31 and 31'. As shown in the Figures, the edges of the ball socket halves 31 and 31' are vertical. Inclined is defined as deviating from the vertical or horizontal. Therefore, an inclined edge is not a vertical edge. Chen does not disclose a socket component having an inclined edge, and therefore does not disclose a socket component having an inclined edge inclined 75° from a lower edge of the socket assembly. Herbermann also does not disclose any edges inclined 75° from a lower edge. Therefore, the combination of these references does not disclose, suggest or teach the claimed invention. Claim 24 is not obvious in view of Chen and Herbermann, and a rejection based on obviousness is improper for Claim 20.

L. The rejection of Claim 29 under 35 U.S.C. 102(b) is improper.

The rejection of Claim 29 is separately contested from the rejection of Claim 13 et al. Claim 29 recites that the arm has a range of motion of 90°. Herbermann does not disclose that the links 26 have a range of motion of 90°. Chen also does not disclose that the rods 40 and 40' have a range of motion of 90°. From Figure 3, it appears that the rods 40 and 40' have a range of motion less than 90°. Both Herbermann and Chen are silent as to the range of motion of the rods 40 and 40'. Therefore, neither Herbermann nor Chen disclose that the rods 40 and 40' have a 90° range of motion. Therefore, the combination of Herbermann and Chen does not disclose, suggest or teach Claim 29. Claim 29 is not anticipated by Chen, and a rejection based on obviousness is improper for Claim 29.

M. The rejection of Claim 30 under 35 U.S.C. 102(b) is improper.

The rejection of Claim 30 is separately contested from the rejection of Claim 13 et al. Claim 30 recites that the gap between the clamp halves is adjustable. Chen does not disclose that the gap between the socket halves 31 and 31' is adjustable. Chen only discloses that the socket halves 31

and 31' are secured together by bolts screw bolts 333 and does not disclose that the gap between the halves 31 and 31' is adjustable. Herbermann discloses a socket 30 that retains a ball 32. The ball 32 is retained in the socket 30 by a worm clamp 28. Therefore, the socket 30 does not include socket halves separated by a gap. Neither reference discloses, suggests or teaches an adjustable gap, and therefore the combination of these references does not suggest the claimed invention. Claim 30 is not obvious, and Appellant requests that the rejection be withdrawn.

CLOSING

For the reasons set forth above, the rejection of all claims is improper and should be reversed. Appellant respectfully requests such an action.

Respectfully Submitted,

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Dated: May 25, 2004

CERTIFICATE OF MAIL

I hereby certify that the enclosed Appeal Brief is being deposited in triplicate with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 25, 2004.



Amy Spaulding

CLAIM APPENDIX

1. A ball and socket assembly comprising:
a socket component including a pair of sockets and a pair of opposed inclined edges, and each of said pair of opposed inclined edges defines an opening for each of said pair of sockets; and
a ball component received in each of said pair of opposing sockets.
2. The assembly as recited in claim 1 wherein said ball component includes a ball and an arm, and said ball is received in said socket to allow for pivotal adjustment of said arm, and one of said arm and said ball extends from said opening.
3. The assembly as recited in claim 2 wherein said balls have a diameter of approximately 1.75 inch and said arms have a diameter of approximately 1.25 inch.
4. The assembly as recited in claim 2 wherein said balls are made of a ball material harder than a socket material of said sockets.
5. The assembly as recited in claim 1 wherein said sockets are made of aluminum.
6. The assembly as recited in claim 2 wherein said sockets cover more than one half of a surface area of said balls.
7. The assembly as recited in claim 1 wherein said socket component includes a first clamp half and a second clamp half that are secured together to form said pair of sockets.
8. The assembly as recited in claim 7 wherein said first clamp half and said second clamp half are secured together by a pair of bolts located substantially between said pair of sockets.

9. The assembly as recited in claim 7 wherein said first clamp half and said second clamp half are secured together by four bolts, one of said bolts being located over one of said sockets, another of said bolts being located under said socket, one of said bolts being located over the other of said sockets, and one of said bolts being located under the other of said sockets.
10. The assembly as recited in claim 7 further including a gap between said first clamp half and said second clamp half.
11. The assembly as recited in claim 1 wherein each of said pair of inclined edges are inclined approximately 75° from a lower edge of said assembly.
12. The assembly as recited in claim 1 wherein said balls are serrated.
13. A robotic arm comprising:
a ball and socket assembly including a socket component having a first clamp half and a second clamp half secured together to form a pair of sockets and a pair of opposed inclined edges, and a pair of ball components each having a ball received in one of said sockets and an arm, and movement of said ball in said socket allows for pivotal adjustment of said arm.
14. The robotic arm as recited in claim 13 wherein said balls have a diameter of approximately 1.75 inch and said arms have a diameter of approximately 1.25 inch.
15. The robotic arm as recited in claim 13 wherein said balls are made of a ball material harder than a socket material of said sockets.
16. The robotic arm as recited in claim 13 wherein said first clamp half and said second clamp half are secured together by a pair of bolts located substantially between said pair of sockets.

17. The robotic arm as recited in claim 13 wherein said first clamp half and said second clamp half are secured together by four bolts, one of said bolts being located over one of said sockets, another of said bolts being located under said socket, one of said bolts being located over the other of said sockets, and one of said bolts being located under the other of said sockets.
18. The robotic arm as recited in claim 13 further including a gap between said first clamp half and said second clamp half.
19. The robotic arm as recited in claim 13 wherein said robotic arm includes a plurality of said ball and socket assemblies.
20. The robotic arm as recited in claim 13 wherein each of said pair of inclined edges are inclined approximately 75° from a lower edge of said assembly.
21. The robotic arm as recited in claim 13 wherein said balls are serrated.
22. A method for supporting an object with a robotic arm comprising the steps of:
providing a socket component including a pair of sockets and a pair of opposed inclined edges; and
providing a ball component including an arm and a ball which is received in each of said opposing sockets;
pivoting said ball in said socket to allow for pivotal adjustment of said arm; and
locking said ball in said socket.
23. The assembly as recited in claim 1 wherein each of said openings expose a portion of each of said balls in each of said pair of opposing socket.
24. The assembly as recited in claim 1 wherein each of said inclined edges are inclined relative to a lower edge and an upper edge of said socket component.

25. The assembly as recited in claim 2 wherein said arm has a range of motion of 90°.
26. The assembly as recited in claim 10 wherein said gap is adjustable.
27. The robotic arm as recited in claim 13 wherein each of said openings expose a portion of each of said balls in each of said pair of opposing socket.
28. The robotic arm as recited in claim 13 wherein each of said inclined edges are inclined relative to a lower edge and an upper edge of said socket component.
29. The robotic arm as recited in claim 13 wherein said arm has a range of motion of 90°.
30. The robotic arm as recited in claim 18 wherein said gap is adjustable.

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